HW2-_sdeekshi.R

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```
art = read.csv("art.csv", header = TRUE, stringsAsFactors =  FALSE)

str(art)
```

```
## 'data.frame':    10000 obs. of  9 variables:
##  $ date      : chr  "2012-01-03" "2012-01-03" "2012-01-03" "2012-01-04" ...
##  $ year      : int  2012 2012 2012 2012 2012 2012 2012 2012 2012 2012 ...
##  $ rep       : chr  "Qiaoli" "Qiaoli" "Barakat" "Thomas" ...
##  $ store     : chr  "Portland" "Portland" "Portland" "Davenport" ...
##  $ paper     : chr  "watercolor" "drawing" "drawing" "watercolor" ...
##  $ paper.type: chr  "pad" "roll" "pads" "pad" ...
##  $ unit.price: num  12.2 21 10.3 12.2 10.3 ...
##  $ units.sold: int  1 1 1 2 1 1 16 2 1 1 ...
##  $ total.sale: num  12.2 21 10.3 24.3 10.3 ...
```

```
#plot 1
par(mfrow=c(2,3))
par(bty = "n")
boxplot(art$total.sale ~ art$paper, col = c("pink","skyblue"), xlab= "Type of paper", ylab ="Tot
al sales")
mtext(text = "Distribution of total sales for water color and drawing papers",side =3, line =1,
adj = 0.5, col = "blue", cex= 1 )


#plot 2
table(art$store)
```

```
##
## Davenport    Dublin  Portland  Syracuse
##      1668      2447      3349      2536
```

```
z=list(art$store, art$year)
m = tapply(art$total.sale, list(art$store, art$year), sum)
m
```

```
##               2012     2013     2014     2015
## Davenport  7032.30  8167.02  8769.47  8804.64
## Dublin    10310.77 11691.09 12162.33 12682.70
## Portland  15228.44 15893.94 18270.23 18091.97
## Syracuse  11468.36 12743.54 13394.03 13465.43
```

```
options(scipen = 999)
x = as.numeric(colnames(m))


plot(colnames(m),m[1,], type = "l", col = "red", lwd = 3,  xlab = "Year", ylab = "Sale",ylim =
c(0,20000),xaxt ='n')
axis(1, at =art$year)
# 1= below, 2= left, 3: top,  4:right
mtext( text = " Sales by region", side = 3, line = 1.5, cex = 1, adj=0.5)

lines(x, m[2,], col="blue", lwd = 3)
lines(x, m[3,], col="orange", lwd = 3)
lines(x, m[4,], col="pink", lwd = 3)

legend('bottomright', legend = rownames(m), lwd = 2, lty = 1, bty ="n",
       col = c("red", "blue", "orange","pink"),cex=0.75)

#plot 3

str(art)
```

```
## 'data.frame':    10000 obs. of  9 variables:
##  $ date      : chr  "2012-01-03" "2012-01-03" "2012-01-03" "2012-01-04" ...
##  $ year      : int  2012 2012 2012 2012 2012 2012 2012 2012 2012 2012 ...
##  $ rep       : chr  "Qiaoli" "Qiaoli" "Barakat" "Thomas" ...
##  $ store     : chr  "Portland" "Portland" "Portland" "Davenport" ...
##  $ paper     : chr  "watercolor" "drawing" "drawing" "watercolor" ...
##  $ paper.type: chr  "pad" "roll" "pads" "pad" ...
##  $ unit.price: num  12.2 21 10.3 12.2 10.3 ...
##  $ units.sold: int  1 1 1 2 1 1 16 2 1 1 ...
##  $ total.sale: num  12.2 21 10.3 24.3 10.3 ...
```

```
m = tapply(art$units.sold, list(art$paper, art$store), sum)
m
```

```
##            Davenport Dublin Portland Syracuse
## drawing         1601   1250     2119     1606
## watercolor      1743   4673     5299     3898
```

```
barplot(m, beside = TRUE, col = c("pink", "skyblue"),xlab ="store region",ylab ="units sold" )
mtext( text = " Units sold by region", side = 3, line = 1.5, cex = 1, adj=0.5)

legend('topleft', legend = c('Drawing paper', 'watercolor paper'), lwd = 2, lty = 1, bty ="n",
       col = c("pink","skyblue"),cex=0.75)

#answer 3: Do stores tend to sell the same ratios of each?
#no stores do not tend to sell the same ratios of each


#plot 4

art.watercolor = subset(art, art$paper =="watercolor")

str(art.watercolor)
```

```
## 'data.frame':    5902 obs. of  9 variables:
##  $ date      : chr  "2012-01-03" "2012-01-04" "2012-01-04" "2012-01-04" ...
##  $ year      : int  2012 2012 2012 2012 2012 2012 2012 2012 2012 2012 ...
##  $ rep       : chr  "Qiaoli" "Thomas" "Yunzhu" "Mohit" ...
##  $ store     : chr  "Portland" "Davenport" "Syracuse" "Davenport" ...
##  $ paper     : chr  "watercolor" "watercolor" "watercolor" "watercolor" ...
##  $ paper.type: chr  "pad" "pad" "pad" "pad" ...
##  $ unit.price: num  12.2 12.2 12.2 12.2 19.3 ...
##  $ units.sold: int  1 2 1 4 1 1 1 1 1 1 ...
##  $ total.sale: num  12.2 24.3 12.2 48.6 19.3 ...
```

```
table(art.watercolor$paper.type)
```

```
##
## block   pad  roll sheet
##  1811  2513   260  1318
```

```
m = tapply(art.watercolor$total.sale, list(art.watercolor$paper.type ,art.watercolor$store),
sum)
m
```

```
##       Davenport   Dublin Portland Syracuse
## block   4467.54 10888.42 14272.92 10192.18
## pad     4835.70 12393.00 14580.00 10692.00
## roll    2645.73  6761.31  9309.05  6761.31
## sheet    836.99  2326.17  2514.82  1864.94
```

```
barplot(m, beside = TRUE, col = c("sienna", "peachpuff3","slategray3","thistle4"),xlab ="store r
egion",ylab ="total sale" )
mtext( text = " Total sale by region for each watercolor paper type", side = 3, line = 1, cex =
1, adj=0.5)

legend('topleft', legend = c('Block', 'Pad','Roll','Sheet'), lwd = 2, lty = 1, bty ="n",
       col = c("sienna", "peachpuff3","slategray3","thistle4"),cex=0.75)
#answer 4: For watercolor only, how are the total sales of the different paper types similar or
 different for each store?
# for watercolor,the total sales of the different paper types isdifferent for each store

#plot 5

str(art)
```

```
## 'data.frame':    10000 obs. of  9 variables:
##  $ date      : chr  "2012-01-03" "2012-01-03" "2012-01-03" "2012-01-04" ...
##  $ year      : int  2012 2012 2012 2012 2012 2012 2012 2012 2012 2012 ...
##  $ rep       : chr  "Qiaoli" "Qiaoli" "Barakat" "Thomas" ...
##  $ store     : chr  "Portland" "Portland" "Portland" "Davenport" ...
##  $ paper     : chr  "watercolor" "drawing" "drawing" "watercolor" ...
##  $ paper.type: chr  "pad" "roll" "pads" "pad" ...
##  $ unit.price: num  12.2 21 10.3 12.2 10.3 ...
##  $ units.sold: int  1 1 1 2 1 1 16 2 1 1 ...
##  $ total.sale: num  12.2 21 10.3 24.3 10.3 ...
```

```
art.davenport = subset(art, art$store =="Davenport")

str(art.davenport)
```

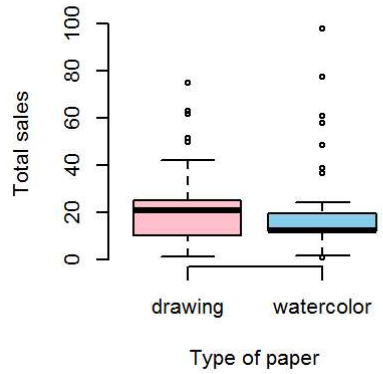
```
## 'data.frame':    1668 obs. of  9 variables:
##  $ date      : chr  "2012-01-04" "2012-01-04" "2012-01-04" "2012-01-05" ...
##  $ year      : int  2012 2012 2012 2012 2012 2012 2012 2012 2012 2012 ...
##  $ rep       : chr  "Thomas" "Mohit" "Mohit" "Thomas" ...
##  $ store     : chr  "Davenport" "Davenport" "Davenport" "Davenport" ...
##  $ paper     : chr  "watercolor" "drawing" "watercolor" "drawing" ...
##  $ paper.type: chr  "pad" "pads" "pad" "journal" ...
##  $ unit.price: num  12.2 10.3 12.2 24.9 24.9 ...
##  $ units.sold: int  2 2 4 1 1 1 1 1 1 3 ...
##  $ total.sale: num  24.3 20.5 48.6 24.9 24.9 ...
```

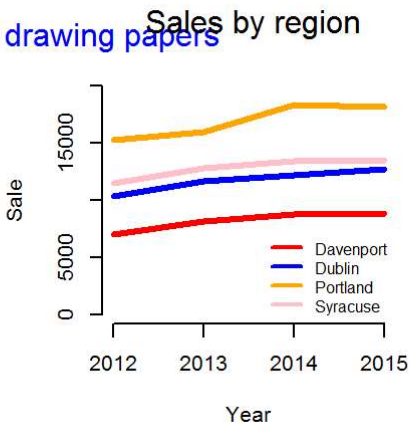
```
table(art.davenport$rep)
```

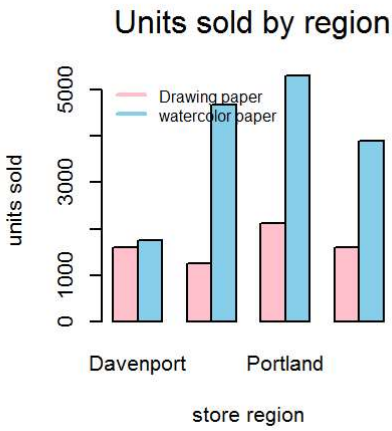
```
##
##  Mohit Thomas
##    667   1001
```

```
m = tapply(art.davenport$units.sold,list(art.davenport$paper,art.davenport$rep ),sum)
View(m)

barplot(m, beside = TRUE, col = c("rosybrown4", "royalblue"),xlab ="Representative",ylab ="total
 sale" )
mtext( text = " Total sales by Davenport representative for each paper type", side = 3, line =
1, cex = 1, adj=0.5)

legend('topleft', legend = c('Drawing paper','Watercolor paper'), lwd = 2, lty = 1, bty ="n",
       col =c("rosybrown4", "royalblue"),cex=0.75)
#answer 5:In the Davenport store, do the sales representatives tend to sell the same amounts of
 water color and drawing paper?
#No, the representaives of davenport do not tend to sell the same amounts of water color and dra
wing paper

#plot 6

m=tapply(art$units.sold,list(art$paper,art$year),sum)
#View(m)

barplot(m, beside = TRUE, col = c("turquoise2", "violetred"),xlab ="Years",ylab ="Units sold" )
mtext( text = "Variation in sales for paper types by years", side = 3, line = 1, cex = 1, adj=0.
5)

legend('topleft', legend = c('Drawing paper','Watercolor paper'), lwd = 2, lty = 1, bty ="n", ce
x =0.75,
       col = c("turquoise2", "violetred"))
```

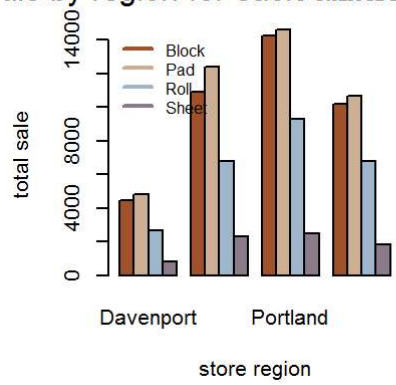
of total sales for water color and drawing papers

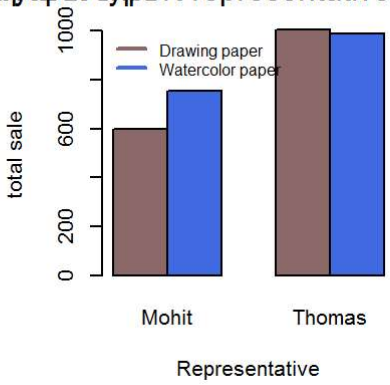


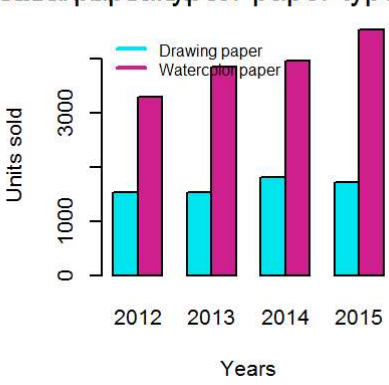




ale by region for each Total sales by Davenport representative for Variation in sales for paper types by








```
#answer 6: Over the years, does the ratio of units sold for water color and drawing paper stay t
he same? Is one growing while the other stays constant?
# watercolor increases, but drawing paper stays same for 2 years and then increases and then dec
reses.
```